

REMARKS

The objections of Claims 1 and 3-8 under 35 U.S.C. § 102(b) as anticipated by, and of Claims 2 and 9 under 35 U.S.C. § 103(a) as unpatentable over, U.S. 5,529,699 (Kuo et al) in view of US 4,964,955 (Lamar et al) and US 5,690,789 (Small et al), are respectfully traversed.¹

In response to Applicants' argument that the description of "close to the head box prior to sheet formation" in Kuo et al is unclear in the sense that it is not necessarily synonymous with "after the last shearing stage", the Examiner now additionally relies on Lamar et al and Small et al to find that the above-excerpted passage from Kuo et al would be after the last shearing stage. In reply, and as the newly-submitted Isermann Declaration declares, while the above-quoted excerpt from Kuo et al "could be after the last shearing stage, the terms 'after the last shearing stage' and 'close to the head box prior to sheet formation' are not synonymous in the art. In other words, 'close to the head box prior to sheet formation' could mean close in terms of time, and would not necessarily be presumed to require that it be after the last shearing stage. Close to the head box is not the same as closest to the head box." (All emphasis by Isermann.)

Isermann further describes, graphically, in the color drawings attached to his Declaration, a simplified flowchart of a typical papermaking process, and the same flowchart overlaid with the various papermaking stages showing Kuo et al's preferred entry points, i.e., added to thin stock, and preferred order of addition, i.e., copolymer followed by microparticle. One overlaid flowchart shows copolymer followed by microparticle both

¹ That the new prior art, i.e., Lamar et al and Small et al, is not listed in the statement of the rejection is irrelevant; reliance thereon is all that is necessary. "Where a reference is relied on to support a rejection, whether or not in a 'minor capacity,' there would appear to be no excuse for not positively including the reference in the statement of rejection." *In re Hoch*, 166 USPQ 406, 407 n.3 (CCPA 1970). See also MPEP 706.02(j).

added at the same stage; the other overlaid flowchart shows copolymer and microparticle added at different stages. Isermann further declares that “for Kuo et al’s purposes, no difference in results would be expected, so long as the copolymer and microparticle are added at any of the alternative points shown” in the corresponding flowcharts.

In response to Applicants’ previous argument that Kuo et al does not anticipate the presently-claimed invention, because it fails to satisfy the test prescribed in *In re Arkley*, 455 F.2d 586, 172 USPQ 524 (CCPA 1972), the Examiner cites *In re Burckel*, 592 F.2d 1175, 201 USPQ 67 (CCPA 1979) for the proposition that a reference is not limited to its preferred embodiments, but must be evaluated for all of its teachings, including its teachings of non-preferred embodiments, and then finds that Kuo et al discloses ranges of molecular weight and charge density that “significantly overlap the claimed ranges; no picking and choosing from additional references was needed or used.”

In reply, Applicants do not challenge the legal proposition for which *Burckel* has been cited, but *Burckel* is inapposite. The question is whether Kuo et al is anticipatory, not whether it is available for non-preferred embodiments. Nor does the absence of reliance on additional prior art mean that the picking and choosing which is proscribed by *Arkley*, was not needed or used. The Examiner necessarily had to pick and choose from the broad disclosure of Kuo et al. As Isermann shows, even within the preferred possibilities regarding entry points and order of addition, picking and choosing had to occur to meet that feature of the present claims. In addition, the recited maximum of 4 meq/g for the charge density of the cationic polymer of the present claims is significantly below the preferable range of 10 to 20 meq/g of Kuo et al. Thus, in order to arrive at the present invention, one skilled in the art would need to select a particular entry point, non-preferred charge density of cationic polymer, and limit applicable cationic polymers to one having an average molar mass of at

least 500,000 Dalton, while the corresponding polymer of Kuo et al can have a molecular weight of as low as 3,000 and as high as 4,000,000 (column 8, lines 24-27).

Moreover, even the disclosure in Kuo et al of charge density in the range of 1 to 24 meq/g, preferably 4 to 22 meq/g, most preferably 10 to 20 meq/g as determined at pH 4 (column 11, lines 14-18) is not "sufficient specificity" to anticipate the recital herein of "not more than 4 meq/g" if this were the **only** limitation to be considered on the anticipation issue. See MPEP § 2131.03. As discussed above, it is not the only limitation.

Note further that Claim 2 requires that the cationic polymer have an average molar mass of at least 5 million Dalton, which would appear to be outside the range disclosed by Kuo et al, and be a polyacrylamide, which is different from the particular water-soluble cationic copolymer of Kuo et al, which is formed from reaction products of an N-vinylamide with either an ester having a quaternary ammonium moiety or a quaternary alkyl pyridinium group or mixtures thereof (column 2, line 63ff).

Indeed, Applicants wish to emphasize that the invention of Kuo et al is the above-discussed water-soluble cationic copolymer *per se*. While described as having use as part of a retention and drainage aid for use in papermaking systems, one skilled in the art would appreciate from Kuo et al that no investigation was made by them of any criticality regarding at what specific stage in the papermaking process it is added.

It is thus clear that Kuo et al is available, at best, under 35 U.S.C. § 103(a) only. But the applied prior art does not recognize Applicants' discovery that when a particular cationic polymer having a particular molecular weight and a particular charge density is used in a microparticle system functioning as a retention aid in papermaking, and the microparticle system is free of polymers having a charge density of more than 4 meq/g, less microparticle system is necessary for a given amount of retention if the microparticle system is added after the last shearing stage before a head box.

The Examiner finds that “[w]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation,” citing *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

In reply, the present claims are patentable under the rationale of *In re Antonie*, 195 USPQ 6, 8-9 (CCPA 1977) (copy enclosed) (exceptions to rule that optimization of a result-effective variable is obvious, such as where the results of optimizing the variable are unexpectedly good or where the variable was not recognized to be result effective). Applicants are entitled to prevail under either of the above exceptions.

It would be useful to review the data showing such results, which show saving of retention aid materials when the presently-claimed invention is carried out. By comparing Example 1 with Comparative Example 1, described in the specification at page 7, line 9ff, it is seen that by adding the cationic polyacrylamide after the last shearing stage, rather than earlier, saving of polymer was 30% and saving of bentonite was 10% for substantially the same FP and FPA retention, while the improvement in drainage over a wire was about 10%. Similar results were obtained, as can be ascertained by comparing Example 2 with Comparative Example 2, described in the specification beginning at page 7, line 41. .

For all the above reasons, it is respectfully requested that the rejections over Kuo et al be withdrawn.

The rejection of Claims 1-10 under 35 U.S.C. § 103(a) as unpatentable over U.S. 6,379,501 (Zhang et al) in view of Kuo et al, and additionally in view of Lamar et al and Small et al, is respectfully traversed.²

In response to Applicants’ previous argument that Zhang et al prefers adding their cationic polymer flocculant before the last shearing stage, the Examiner again finds, in effect, that a reference is not limited to its preferred embodiments.

² See n.1, *supra*.

In reply, Applicants agree, as discussed above, but the applied prior art could not have predicted the results obtained by Applicants, as discussed above, when adding their microparticle system after the last shearing stage before a head box.

Indeed, the Examiner has never challenged the superior results obtained by Applicants. Rather, the Examiner simply finds that if not anticipated, doing what Applicants have done would have been obvious. However, the Examiner must consider **all** the evidence in the record. Since the actual data disclosed in the specification and discussed by Applicants have not even been discussed in the Office Action, it is clear that the Examiner has not considered the invention **as a whole**, as required by 35 U.S.C. § 103(a).

The Examiner cites *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977) for the proposition that when claimed and prior art apparatus or product are identical or substantially identical in structure or composition, a *prima facie* case of anticipation or obviousness has been established, and that “when the structure in the reference is substantially identical to that of the claims, the claimed properties or functions are presumed to be inherent.”

In reply, *Best* is inapposite since neither Zhang et al nor Kuo et al are identical or substantially identical in structure or composition vis-vis the presently-claimed process, as discussed above.

For all the above reasons, it is respectfully requested that this rejection be withdrawn.

Application No. 10/523,417
Reply to Final Office Action dated June 9, 2006

All of the presently-pending claims in this application are now believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

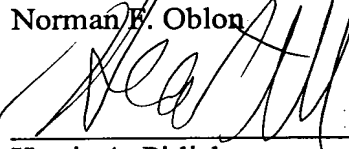
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